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To:	Examiner Ishrat I. Sherali	**From:**	Steven L. Nichols
Fax:	(571) 273-8300	**Pages:**	10 pages including coversheet
Phone:		**Date:**	November 28, 2005
Re:	Notice of Appeal - 10/769,393		

☒ **Urgent**   ☒ **For Review**   ☐ **Please Comment**   ☐ **Please Reply**   ☐ **Please Recycle**

Transmitted, herewith, are the following documents:

1. Facsimile coversheet (1 page)

2. Pre-Appeal Brief Request for Review (6 pages)

3. Notice of Appeal from the Examiner to the Board of Patent Appeals and Interferences (1 page)

4. Duplicate Copy of Notice of Appeal from the Examiner to the Board of Patent Appeals and Interferences (1 page)

5. Certificate of Transmission (1 page)

40169-0059   10/769,393

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Patent Application of

Z. Jason Geng

Application No. 10/769,393

Filed: **January 30, 2004**

For: Three-Dimensional Ear Biometrics
      System and Method

Group Art Unit: 2621

Examiner: SHERALI, Ishrat L.

PRE-APPEAL BRIEF REQUEST FOR REVIEW

MS After-Final
Commissioner for Patents
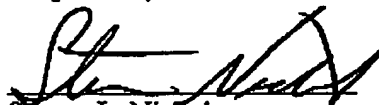P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

                                            Respectfully submitted,

DATE: 28 November 2005

                                            Steven L. Nichols
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<u>REMARKS</u>

With regard to the prior art, claims 1-18, 27-34, 40-47 were rejected under 35 U.S.C.

§ 103(a) in view of the combined teachings of the article "An Evaluation of Face and Ear

Biometrics" by Victor et al. ("Victor") and the article "Human Ear Recognition in 3D" by

Bhanu and Chen ("Bhanu"). This rejection is respectfully traversed for at least the following

reasons.

Claim 46 recites.

> A system for generating an image database comprising:
> a means for generating a three-dimensional image of a subject; and
> a computing device communicatively coupled to said means for generating a
three-dimensional image;
> wherein said computing device is configured to receive a three-dimensional
image from said means for generating a three-dimensional image and <u>generate
multiple two-dimensional images, each two-dimensional image having a varied
orientation or illumination condition based on said three-dimensional image</u>.

(emphasis added).

In contrast, neither Victor nor Bhanu teaches or suggests generating multiple two-

dimensional images *based on a three-dimensional image*. Applicant wishes to note that the

two-dimensional images claimed are generated *based on* a corresponding three-dimensional

image. The final rejection appears to have entirely overlooked this aspect of the claim. The

cited prior art fails to teach or suggest the claimed computing device that generates multiple

two-dimensional images having a varied orientation or illumination condition *based on a*

corresponding three-dimensional image.

The final Office Action argues that "Victor expressly mentions 'the lighting

arrangement and positioning of lights, camera..' which 'taken on different days' or different

expression." (Action of 7/26/05). This reading of Victor supports Applicant's argument.

Victor may teach taking 2D pictures on different days or with different expressions using

different arrangement and positioning of lights and camera. This, however, teaches away

from Applicant's claimed computing device that produces multiple two-dimensional images

based on a corresponding three-dimensional image. The prior art fails to teach or suggest

such subject matter. Moreover, the final Office Action fails to indicate how or where the

cited prior art teaches such subject matter.

2

This argument is further supported by the fact that Victor does not ever mention three-dimensional images and is, therefore, irrelevant to the highlighted feature of claim 46. Bhanu teaches the use of "2D histograms," but histograms are *not* two-dimensional images as claimed. Rather, as explained by Bhanu, a "2D historgram consists of shapes indexes and angles between the normal of reference point and that of its neighbors." (Bhanu, col. 2, first full paragraph). Moreover, only one 2D historgram is generated for each 3D ear representation.

In this regard, the final Office Action cited to Bhanu at Figs. 5 and 6. However, these figures illustrate *different* ears. "The model ears are shown in Figure 5, and the test ears are shown in Figure 6." (Bhanu, sec. 4.1). Thus, these Figures do not teach or suggest multiple two-dimensional images *based on a single corresponding three-dimensional image* as Applicant has claimed.

Consequently, no prior art reference of record teaches or suggests a computing device as recited in claim 46 that generates multiple two-dimensional images, each two-dimensional image having a varied orientation or illumination condition *based on a corresponding three-dimensional image*. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 46 and 47 should be reconsidered and withdrawn.

Claim 12 recites:

A method of creating and using a database of ear images for automatic human identification comprising:
generating a three-dimensional image of an ear for each of a number of identified people; and
generating a database comprising a plurality of two-dimensional images based on each said three-dimensional image;
wherein each of said plurality of two-dimensional images represents a varied orientation or illumination condition on said three-dimensional image.

As demonstrated above, neither Victor nor Bhanu teach or suggest a method that involves generating a database of two-dimensional images *based on three-dimensional images* of the ears of identified people as claimed. Again, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03.

3

Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 11-18 should be reconsidered and withdrawn.

Independent claim 27 recites

> A system for three-dimensional biometric identification comprising:
> a camera system;
> a database of images of identified ears, wherein said database of images comprises a three-dimensional image of an ear of each of a plurality of identified subjects and a plurality of two-dimensional images generated from each of said three-dimensional images, wherein each of said two-dimensional images represents a varied orientation or illumination condition on a corresponding three-dimensional image; and
> a computing device communicatively coupled to said camera system and to said database of images of identified ears;
> wherein said computing device is configured to match an image of a subject's ear acquired by said camera system against said database of images of identified ears to identify said subject.

(emphasis added).

As demonstrated above, neither Victor nor Bhanu teach or suggest a system that involves a database of two-dimensional images "*generated from*" each of a number of three-dimensional images of the ears of identified subjects as claimed in claim 27. Again, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 27-34 should be reconsidered and withdrawn.

Claim 1 recites:

> A method of automatic human identification, said method comprising matching an image of a subject's ear against a database of images of ears of identified subjects to identify said subject, wherein said database of images comprises a three-dimensional image of an ear of each of a plurality of identified subjects and a plurality of two-dimensional images generated from each of said three-dimensional images, wherein each of said two-dimensional images represents a varied orientation or illumination condition on a corresponding three-dimensional image.

(emphasis added).

As demonstrated above, neither Victor nor Bhanu teach or suggest a method that involves a database of two-dimensional images *generated from three-dimensional images* of the ears of identified subjects as claimed. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently

4

described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claims 1-10 should be reconsidered and withdrawn.

Independent claim 40 recites:

> A system for three-dimensional biometric identification comprising:
> a means for generating a two-dimensional image of a subject's ear;
> a database of images of identified ears, wherein said database of images comprises a three-dimensional image of an ear of each of a plurality of identified subjects and a plurality of two-dimensional images generated from each of said three-dimensional images, wherein each of said two-dimensional images represents a varied orientation or illumination condition on a corresponding three-dimensional image; and
> a means for matching said two-dimensional image of a subject's ear against said database of images of identified ears to identify said subject.

(emphasis added).

As demonstrated above, neither Victor nor Bhanu teach or suggest a system for biometric identification that involves a database of two-dimensional images *generated from three-dimensional images* of the ears of identified subjects as claimed. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claims 40-45 should be reconsidered and withdrawn.

Claims 19-22 were rejected as anticipated under 35 U.S.C. § 102(b) by Victor. This rejection is moot as to claims 19-21, which are cancelled herein without prejudice or disclaimer. For at least the following reasons, this rejection is respectfully traversed with respect to claim 22.

Claim 22 recites:

> An image matching method comprising performing an Eigen-ears identification method, said method further comprising:
> performing an Eigen-ear classification procedure on a plurality of two-dimensional ear images; and
> performing an Eigen-ear recognition procedure on a received two-dimensional ear image.
> wherein said Eigen-ear classification procedure comprises:
> computing a weight vector of each of said two dimensional ear images;

5

> said plurality of two-dimensional ear images being classified according to said weight vectors; and
> wherein said Eigen-ear recognition procedure comprises:
> computing a weight vector of said received two-dimensional ear image; and
> identifying said received two-dimensional ear image as belonging to a class if one of said weight vectors minimizes a Euclidean distance to said weight vector of said two-dimensional ear image below a threshold value.

(emphasis added).

In contrast, Victor fails to teach or suggest the claimed method including "identifying said received two-dimensional ear image as belonging to a class if one of said weight vectors minimizes a Euclidean distance to said weight vector of said two-dimensional ear image below a threshold value."

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claim 22 should be reconsidered and withdrawn.

6